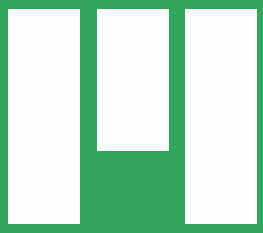

MUSCHARA

Human and Organizational Performance:
A practical application of safety science

A White Paper on a Strategic Approach to Managing the Risk of Human Error in Operations

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This whitepaper attempts to do three things: a) briefly describe human performance in an operational context, b) introduce an approach essential to successfully managing operational risk through *human and organizational performance* (H&OP) and c) describe the services offered by Muschara Error Management Consulting, LLC (See http://www.muschara.com).

Managing human performance risk effectively involves all the following elements:

- defining the gap between where you are and where you want to be and developing a plan to close the gap
- implementing the plan to achieve the desired outcome
- regular monitoring of progress relative to the outcome's acceptance criteria
- adjusting the plan as needed to close the gap more effectively, efficiently, or safely

Yes, managing is important, even to something that tends to be capricious and resistant to being managed—human error. However, in relation to your organization's mission and the safety of its people and assets, you cannot leave human performance (and human error) to chance. You MUST manage the risk posed by human error in your operations purposefully and intentionally. However, you cannot manage what you do not understand. Individual *human performance* (Hu) is NOT common sense. Performance, especially failure, always involves complex relationships: relationships between people and processes, people and technology, people and machines, people and other people.[1] Therefore, to be consistent and effective managing human performance and its associated risks, it is important to understand some of the theory and fundamentals of human performance.

Defining Human and Organizational Performance

$$Hu = B + R$$

Dr. Aubrey Daniels, a well-known authority on human behavior in the workplace, defines *human performance* as (Hu), one or more behaviors, B, directed toward accomplishing some outcome or result, R.[2] To perform is to act in a way that accomplishes a desired outcome.[3] The commercial nuclear industry adopted the abbreviation Hu in the mid-1990's to avoid confusion with another field of performance called health physics (HP), a domain of technology aimed at protecting people from the adverse health effects of radiation. Hu is used in this paper to refer to *individual* human performance. However, human performance in relation to its broader context of the organization within which people perform is managed differently. To make this distinction from individual human performance, Hu, I use the abbreviation H&OP, *human and organizational performance.* The concept of H&OP refers to the *collective* performance of an organizational unit involving the work outputs of many workers performing within the systemic context of the organization's technical and social environments. The practice of H&OP involves work across the spectrum of the organization, which can be divided into two broad categories, the sharp end and the blunt end.*

* The sharp end of an organization includes those individuals who interact directly with intrinsic hazards, performing the physical work of creating value in the production processes, while the blunt end comprises the policy makers, line

THE HUMAN ELEMENT IN OPERATIONS

Human error is a behavior that unintentionally deviates from a desired behavior. I prefer to characterize human error simply as a *loss of control*. Most errors are trivial, but sometimes errors are grievous causing you, coworkers, and your organization a great deal of pain, frustration, cost, and, sometimes, heartache. Most people do not have a proper understanding of human error, and without a proper knowledge and attitude toward human error and its organizational context, your company's ability to cope with the impact of human error is at risk.

Companies face ever increasing demands for profitability, quality, reliability, and safety; striving to do more with less. Using fewer people and fewer resources at a higher pace in complex work environments is a recipe for harm, and the cost of doing business this way is aggravated by "simple" human error. As a manager, you are compelled to look for ways to meet these competitive pressures while minimizing the risk that human error poses to your company's bottom line, including the safety of your employees. Therefore, managers, supervisors, and front-line staff need practical methods to help them anticipate and manage situations that MUST absolutely go right every time. This is accomplished most effectively and efficiently by establishing positive control at CRITICAL STEPS.

Context of Human Performance: Work and the Workplace

Generally, industrial operations involve the production of goods and services that are suitable for use or have economic value. Production includes the processes and methods used to *transform* tangible resources (raw materials, semi-finished goods, subassemblies) along with intangible ones (data, information, knowledge, expertise) into goods or services—thus adding value.[4] In addition to adding value, one of the essential goals of successful operations includes the avoidance of harm, especially harm triggered when we lose control—human error.

Work creates value. The work of production involves a series of human actions—making, constructing, assembling, or manufacturing an end product. People are intrinsic to the production process—they touch things to accomplish the organization's goals. Multiple and varied human actions occur during the transformation process in handling materials, parts, machinery, assemblies/subassemblies, tools, and information from their natural, unprocessed state to a finished product state. Other human involvement includes planning, scheduling, routing, shipping, dispatching, storage, etc. The end result of production comprises all goods and services that are delivered or provided to a customer or end-user.

Human beings are involved in much of the production and delivery processes. All along the way, people *touch things*, and with every touch there is the potential to either create or extract value. Take a moment to consider some of these *touchpoints*.[†] They could involve multiple transfers of energy, several movements of mass from one place to another, or they may consist of the creation

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managers, designers, and other support personnel in creating expectations, resources, and incentives, among other various conditions for production personnel at the sharp end.

[†] A touchpoint is a human interaction with an object such that the state of that object is changed or altered in some way. This involves work, a force over a distance.

and/or the transmissions of information or data from one repository to another. To accomplish work, human actions require the use of tools or systems that present inherent hazards, most of the time, energy. We are interested in those touchpoints that involve permanent change when people work. Therefore, to accomplish production operations in an organized, efficient, reliable, yet safe manner—*control, learning, and adaptation are necessary*. More on this later.

> A CRITICAL STEP is a human action that will trigger immediate, irreversible, and intolerable harm to an asset, **if** that action or a preceding action is performed improperly.

Safety is traditionally described as the freedom from an unacceptable risk of harm. But, harm to what? Events and accidents are always defined in terms of harm to assets, without which there is no event, except in the case of a near-miss. Assets include people, product, property, facilities, reputation, equipment, and anything important to the organization's reason for being—its mission. Assets and their limitations define the harm that could be realized and what constitutes an event.‡

Harm involves an unwanted change in the state of assets or serious degradation or termination of the organization's ability to accomplish its mission. Every organization possesses multiple assets, but some are more important than others—i.e., people and product as a minimum. Strategically, it is important to protect these assets from harm due to the residual, intrinsic hazards present in your operations.

Events have many names, such as incident, accident, deviation, nonconformance, etc. In other contexts, the term "event" can refer to everyday occurrences such as a birthday party, a wedding, a concert, or a baseball game. But in human and organizational performance, managing human error in operations, the word *event* refers to unwanted outcomes that involve harm to assets such as the following:

- *People* who are killed, injured, or infected with a disease
- *Product* or *property* that is lost, defective, damaged, or destroyed
- *Environment* that is contaminated, spoiled, or ruined
- *Reputation* that is defamed or tarnished
- *Value* that is lost

The occurrence of an *event*—the onset of loss of or damage to one or more assets—strongly indicates that control over the damaging properties of hazardous processes has been lost—*usually* triggered by some form of human failing.[5] But, the harm that ensues is more the result of ineffective defenses, where the barriers or safeguards are either missing, ineffective, or circumvented.

‡ Near-misses are important to those who oversee the company because they recognize that the operation was performed out of control, and under different circumstances, harm would have been realized. This is unacceptable. Therefore, near-misses must be evaluated to regain control of the operation.

Sustaining safety in operations is essentially a *control* problem—control of 1) human variability during high-risk activities and 2) hazardous processes used to create value.[6] Therefore, the word *event* as used in this paper denotes harm to an asset due to an uncontrolled:

- Transfer of energy (such as mechanical, gravity, electrical, chemical)
- Movement of matter (solids, liquids, or gasses)
- Transmission of information or data

These three work situations involve hazards of various types that are intrinsic to industrial operations. Intrinsic physical hazards used in industrial operations have the potential for causing harm to all kinds of assets, such as people, products, environment, and property. Generally, hazards are either inherent to the material or to its conditions of use.

Because of human fallibility and the prevalence of human beings in operations, human performance poses the greatest source of variation in operations, which is typically manifested by some form of human error.[7] Yes, people are a hazard. However, rare events can occur by the "normal" functioning of the organization due to combinations of actions and conditions not anticipated by the organization's managers, the procedures' authors, or the facility's designers. Variations with behavior leads to variations in results, and the prevalent trigger of events is most often attributable to human error. It is crucial for managers of operations to understand that it is not the *error* that triggers an event that you should be concerned about. It is the *harm* to one or more assets that results from the error. If we can, we want to avoid both losing control and suffering the harm. Each are managed differently.

The primary challenge for managers is one of risk. In the healthcare industry, the admonition is to, "first, do no harm." In high-hazard operations that is exactly the mindset that managers and leaders need to instill at all levels of the organization. In the following paragraphs I describe one frame of reference for managing the risk of human error in operations that focuses on "doing no harm."

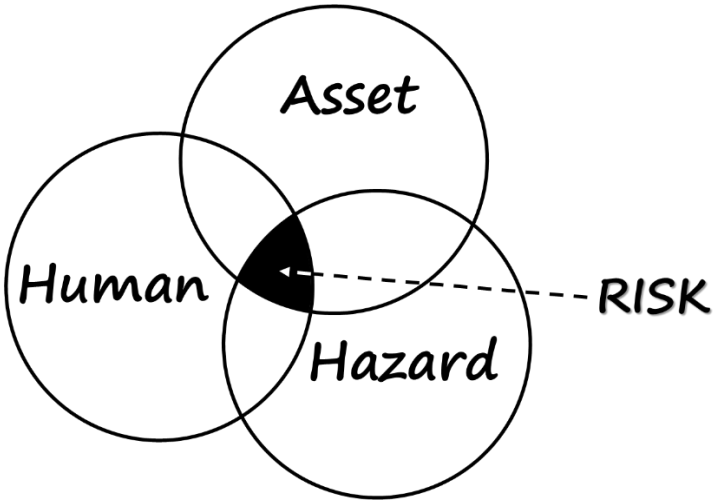
A Model of What to Manage

Thus far, I have addressed human performance, the notion of human error, the importance of protecting assets during operations from intrinsic hazards in the workplace, and what constitutes an event. Now we can arrange these concepts together in a workable model that will help you manage the uncertainty of human error in the workplace, avoiding events. Whenever work is performed, three things are present:

1) Assets (things important, of high value, to an organization)
2) Hazards (intrinsic sources of energy use to create value)
3) People (work they do to create value, transformation processes)

The figure below illustrates the relationships between assets, hazards, and people—what I call the human performance "risk concept." This mental model enriches the understanding of operational

human performance among managers, supervisors, and even workers. It also is an accurate visual of the uncertainty that human fallibility introduces to an operational setting. Because of the potential impact on the organization, this uncertainty is a strategic uncertainty. The presence of uncertainty in the interactions between assets and hazardous processes creates a strategic risk. Therefore, managing human error in operations is as important as managing production—they must occur concurrently, not separately.



Human Performance Risk Concept

This model can also be represented alternatively in a pseudo mathematical form:

$$\text{Asset} + \text{Hazard} + \text{Human} \rightarrow \text{Risk}$$

Interactions or combinations are illustrated by the plus signs (+) (overlapping circles). The first '+' sign represents the establishment of a *pathway* for either the transfer of energy, movement of mass, or transmission of information between an intrinsic hazard and an asset, where only one action (or failure) is needed to initiate value creation (under control) or harm (out of control). A pathway for harm exists when a hazard is poised in such a way as to *expose* an asset to potential harm—a condition. For example, a firearm that has a bullet loaded in the chamber, with the safety off, and the hammer cocked is poised to be discharged. The firearm is 'ready' to be fired with one action—pulling the trigger. A person would be exposed to harm if standing in front of the muzzle of a firearm in such a condition, especially if the firearm is wielded by another person with their finger on the trigger.

The photo below illustrates in classic fashion the human performance risk concept. This photograph, "Lunch atop a Skyscraper," taken in 1932 during the construction of the RCA building in New York City, highlights the three distinct elements of Hu risk: asset, hazard, and human. Obviously, the assets are the people, the steelworkers. What makes the photograph breathtaking is the obvious hazard—the beam the workers are sitting on is more than 800 feet about the streets below. The apparent absence of barriers to prevent them from falling makes it doubly fearsome, which is accentuated by the fact that people, including steelworkers, are fallible. They are one

mistake (misstep) away from falling. Out of camera range, there is a netting stretched below the men to catch them should they lose their balance on the high beams.

"Lunch Atop a Skyscraper." © Bettmann/Corbis, courtesy First Run Features

The second '+' sign represents a human touchpoint. Recall that a touchpoint is a human interaction with an object that changes the state of that object—work. Touchpoints involve a force applied over a distance. Because of human fallibility, touchpoints create uncertainty regarding the action to be performed, whether under control or out of control. The interaction of assets, hazards, and human beings create (→) the conditions for risk—a loss of control. Eric Hollnagel explains events as "unusual combinations of conditions," which emerge from the weaknesses embedded in the system, including human fallibility.[8] In human performance, risk is managed by exerting control over these combinations—touchpoints and pathways.

Both the creation of pathways and the occurrence of touchpoints (work) is a normal part of everyday operations. Pathways establish conditions for the creation of value through the transfer of energy, a movement of mass, or a transmission of information. Value is accomplished by the actions of front-line workers such as pilots, operators, surgeons, nurses, and craftsmen. If an action is performed in error, the performer potentially loses control and harm—an event—is likely to occur. This suggests that defenses must be built into the facility design, production processes, procedures, and expectations to protect the asset from errant operations. Otherwise, harm is likely.

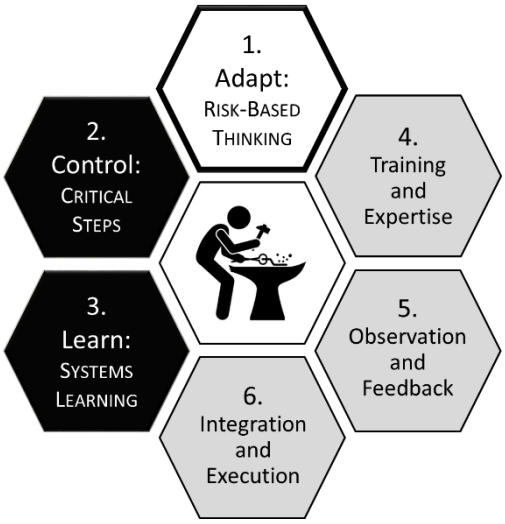
Risk is born with the creation of *pathways* and *touchpoints*. The anchor point in any event occurs at a point in time when control is lost over the damaging properties of energy, mass, and information; when the destructive potential of intrinsic hazards are unleashed because of a loss of control or the absence of adequate protection.[9] Therefore, risk is reduced through the prudent deployment of controls, barriers, and safeguards to lessen the chance of human error at important pathways and touchpoints.

HUMAN AND ORGANIZATIONAL PERFORMANCE: THE BUILDING BLOCKS OF MANAGING H&OP

Traditional industrial/occupational health and safety programs focus on creating safe work environments for front-line worker. These programs also depend on knowledgeable workers recognizing hazardous situations and making sound decisions in the workplace. However, as facilities and equipment become more complex, occupational health and safety alone is not enough to achieve the next level of safety for the organization.

Strategically, what should managers "control?" As stated earlier, H&OP is all about managing the risk human error poses to an organization's operations. Considering the Hu Risk Management Model, the Building Blocks of Managing H&OP suggest specifically what managers should pay attention to and what to do. As illustrated in the figure below, H&OP involves three core operational functions and three management support functions. The core operational functions that involve daily risk management include:

1. RISK-BASED THINKING – adapting to changing and emerging risks
2. CRITICAL STEPS – ensuring the right things go right at critical touchpoints operationally
3. SYSTEMS LEARNING – detecting and correcting systemic weaknesses with defenses and their related management systems



The Building Blocks of Managing H&OP

Cells 4, 5, and 6 identify the more important management practices that support the effectiveness of cells 1 through 3. These include:

4. Training and Expertise – ensuring front-line personnel possess technical knowledge and skill to exercise RISK-BASED THINKING and to recognize and control CRITICAL STEPS
5. Observation and Feedback – creating operational opportunities for individual learning for front-line workers and SYSTEMS LEARNING for line managers
6. Integration and Execution – enabling 1) RISK-BASED THINKING as a way of thinking, doing work, and doing business, and 2) managerial accountability for the implementation of the H&OP's core functions

Principles of Managing H&OP

Managing H&OP effectively depends on understanding and accepting a set of fundamental first principles—*core beliefs*. The functions of the building blocks of managing H&OP are based firmly on the principles described below. All levels of management in an organization must take to heart these principles before embarking on serious changes in their approach to managing human error risk in operations. Otherwise, H&OP will not take and will fail to influence people's consciousness of the potential consequences of what people do in the workplace. To sustain

resilience in human and organizational performance management, actions and initiatives must remain consistent with the principles described below. Otherwise, misalignments will occur in the organization leading to efforts working at cross purposes.

1. **People have dignity and inherent value as human beings**. Everyone wants to be treated with respect, fairness, and honesty, characteristics that are important to building trust and communication within any organization. People should not be treated as a liability—as objects to be controlled, but as knowledgeable and respected agents of the technical side of the organization who have its best interests at heart. Relationships are integral to open communication, and there are no laws against treating people with dignity and respect.

2. **People are fallible**. To err is human—error is normal. Fallibility is a permanent, intrinsic feature of the human condition, and this trait poses a hazard when people do work. Human fallibility can be moderated, but it cannot be eliminated. It introduces uncertainty into any human endeavor, especially hands-on industrial work. However, people are also brilliant. They possess a wide range of capabilities and can adapt and improvise to accommodate inadequate resources, weak training, poor tools, schedule conflicts, process shortfalls, among other workplace vulnerabilities. In order to protect assets, they can adjust what they do. Assume people will err at the most inopportune time. Then, manage the risk.

3. **People do not come to work to fail**. Most people want to do a good job—to be winners, not losers. Error is not a choice—it is unintentional. Nobody errs purposefully. Error is not sin—it is not immoral. Error tends to break things. Sin, in contrast, is selfish in nature and tends to break relationships. Reprimanding people for error serves no benefit. People are goal-oriented, and they want to be effective. They adapt to situations to achieve their goals. This means well-meaning people will take shortcuts, now and then, if the perceived benefit outweighs the perceived cost and risk. This, too, is normal. All people's actions, good and bad, are positively reinforced, usually by their immediate supervisors and by personal experiences of success (as they perceive it), which sustains their beliefs about "what works" and what does not. Sometimes perceptions are wrong.

4. **Errors are predictable and manageable**. Human error is not random—it is systematically connected to the work environment—the nature of the task and its immediate environment and the factors governing the individual's performance.[10, 11] Despite the certainty of human error over the long period for large populations, a specific error for an individual performing a particular task at a precise time and place under certain conditions can be anticipated and avoided.[12] [13] For example, what is the most likely error when writing a personal check on 2 January of every year? You KNOW the answer. However, not *all* errors can be anticipated or prevented. This is why defenses are necessary. As your organization matures in its application of RISK-BASED THINKING, there will be less dependence on predicting the occurrence of human error and more focus on protecting assets from harm.

5. **Risk is an inherent, dynamic feature of the way an organization operates**. When work is executed, various intrinsic sources of energy, tools, and material are used to accomplish the work. Consequently, hazards exist (built in) within an organization's facilities because of its purposes. For larger, more complex organizations, risk is dynamic and lurks everywhere, and it varies as an outcome of the diverse ways an organization is designed, constructed, operated, maintained, and managed as well as its tempo of operations. Safe and resilient organizations are designed and built on the assumptions that people will err, things are not always as they seem, equipment will wear out or fail, and that not all scenarios of failure may be known before operations begin.

6. **Organizations are perfectly tuned to get the results they are getting**. People can never outperform the system that bounds and constrains them.[14] All organizations are aligned internally to influence the choices people make and the outcomes they experience—good and bad. All work is done within the context of its management systems, its technologies, and its societal, corporate, and work-group cultures. Organizations comprise multiple, complex interrelationships between people, machines, and various management systems, and managers go to great lengths to create systems for controlling the work. But we all know, there is no such thing as a perfect human, perfect system, perfect process, or perfect procedure. Once systems go into operation, they prove to be imperfect.[15]

7. **The causes of tomorrow's events exist today**. The conditions necessary for harm to occur always exist before realizing the harm. Some are transient, most are longstanding. Most of the time these conditions are hidden or latent. Latent conditions tend to accumulate everywhere within an organization and pose an ongoing threat to the safety of assets.[16] These conditions are shaped by weaknesses at the organizational and managerial level, and they manifest themselves in the workplace as faulty protective features, hidden hazards, and error traps. These system weaknesses and workplace vulnerabilities usually exist long before the unwanted consequences ever come to fruition. This means that events are organizational failures.

STRATEGIC WAYS MEMC CAN HELP

MEMC's Mission: To help managers and leaders of high hazard operations protect people, product, and property from the human element by providing them with risk-based error management principles and applications, developed from leading-edge research and hands-on experience, while honoring God and others through Wisdom, Integrity, and Love. With this mission in mind, Muschara helps you in three important ways:

First, by anticipating **CRITICAL STEPS**, operations on the shop floor stand a greater chance of being accomplished without incident—without harm to assets. As the number of CRITICAL STEPS performed without error increase, so the frequency of events decreases.

> **A CRITICAL STEP is a human action that will trigger immediate, irreversible, and intolerable harm to an asset, if that action or a preceding action is performed improperly.**

I can help you identify CRITICAL STEPS through a systematic mapping process, which is followed up with the development of the means of controlling human interactions with assets and hazards at these points in your operations.

Second, and I think more important than controlling performance at CRITICAL STEPS, creating and sustaining a tenacious approach to **SYSTEMS LEARNING** tends to reduce the severity of events. By establishing a relentless pursuit of the true condition of their management systems, its culture, and its work management processes, managers will improve the resilience and robustness of it defenses (controls, barriers, and safeguards) that protect key assets from inevitable human error. System Learning is characterized by:

- Identifying and learning from important and persistent differences between work as done and work as imagined (or planned); recognizing important drift from expectations
- Minimizing the accumulation of hidden system weaknesses that undermine safety of assets, the reliability of operations, and the integrity and robustness of defenses
- Observing and coaching performance in the workplace
- Integrating RISK-BASED THINKING and chronic unease into important business processes

Together, an effective human and organizational performance strategy that combines control of variation at CRITICAL STEPS and system learning tends minimize both the frequency and severity of events.

Finally, and I think most importantly, I help managers understand how to integrate **RISK-BASED THINKING** into all facets of operation at all levels of the organization.

> **RISK-BASED THINKING is a habit of thought in the conduct of work that systematically creates a clear understanding of risk to assets during work, characterized by anticipating, monitoring, responding, and learning.**

Whenever people engage in work involving transformations of assets—using various forms of energy, movements of mass, or transmissions of information—caution and care are definitely necessary. People want to create value, not harm. On most occasions procedures, checklists, skill, or policies guide work. But, in some unforeseen cases, threats and challenges arise that have no precedent—no guidance how to respond to them. Therefore, front-line personnel must "think on their feet," being able to adjust to novel work situations to keep the asset within its safety boundaries. People must be able to adapt for safety sake.

Research in resilience engineering has identified four cornerstone processes of successful organizations that enhance mindfulness of operational risks.[17] These cornerstones of logic include the following practices:

- **Anticipate** – *know* what to expect
- **Monitor** – *know* what to pay attention to
- **Respond** – *know* what to do, when

- **Learn** – *know*:
  - what has happened
  - what is happening
  - what to change

As you can, see RISK-BASED THINKING encourages people to proactively and intentionally make things go right instead of mindlessly letting things happen to them—to *know*. Inherent in RISK-BASED THINKING is a **chronic unease** among employees who possess an ongoing mindfulness of transfers of energy, movements of mass, or transmissions of information during work—planned and unplanned—related to key assets. People are aware of the key assets they work with and their intrinsic hazards—they think before acting to *prove* to themselves the safety of assets before doing work.

Specific Services Offered by MEMC

Human Performance Consulting. I help line managers resolve current operational human performance issues relative to safety, quality, production, delivery, efficiency, and services. As a Certified Performance Technologist (CPT), my approach to consulting is guided by the following key traits espoused by the International Society for Performance Improvement (ISPI):

- **Results-focused** – with respect to business outcomes that are threatened or not obtained (used to judge performance improvement and effectiveness of corrective actions)
- **Systemic aspects emphasized** – identification of local factors influencing performance linked to relevant organizational components; identification of organizational and related local factors influencing performance
- **Value-added recommendations** – clear understanding of the risks and benefits of corrective actions to the organization's mission
- **Partnership with client** – consulting engagement conducted with the participation of representatives of key organizational stakeholders

Independent Assessments. My purpose is to identify opportunities for improving the management of the risk of human error during operations for discrete organizational units (business units). I identify gaps in the management of the risk of human error compared to state-of-the-art practices, processes, and conditions; providing practical recommendations to close the more important gaps.

CRITICAL STEP MAPPING. CRITICAL STEP MAPPING is a systematic tabletop analysis of key operations to identify CRITICAL STEPS, related risk-important actions, and countermeasures that create positive control interventions. A table-top analysis is conducted in collaboration with process experts and experienced operator representatives using a systematic mapping process. Together, we identify CRITICAL STEP(s) and related risk-important actions for at least one manufacturing process. This service consists of the following elements:

- One-day classroom instructor-led course on CRITICAL STEPS and the CRITICAL STEP MAPPING process attended by process engineers, procedure writers, and production operators.
- Two-to-three days of table-top analysis of one or more production processes until I am convinced the participants are proficient with the mapping process.
- Integrate outputs of CRITICAL STEP mapping into related pre-job briefings for specific work tasks

Human Performance Training. Instructor-led classroom training courses are offered for executives/senior managers, line managers and supervisors, front-line production staff, event analysts, and human performance practitioners. The overall strategic intent of acquiring the knowledge and skills is to ultimately minimize the frequency and severity of human performance events. Also offered is advanced training for human performance specialists (train-the-trainer) to improve their support of the organization's management of human performance, such as observation and coaching, human performance technology (HPT), and strategic risk management.

- Training for executives (half day to one day), and line managers and supervisors (two days) is oriented toward an understanding H&OP and its risk-based approach to managing human error risks to key assets.
- Training for workplace production staff (one-to-two days) promotes an understanding of basic human performance fundamentals and the skills to manage, promote, and sustain safe and reliable human performance work practices (Hu Tools) during work execution, identifying and controlling CRITICAL STEPS in high-hazard operations.
- A comprehensive course, offered to Human Performance Practitioners (specialists), involves a complete technology transfer. This five-day course provides the depth of knowledge necessary to train and mentor others in managing H&OP. These courses require execution of a non-exclusive license agreement.

Human Performance Tools (Non-technical Skills). I assist you in developing behavior-based, Hu Tools (aimed at integrating anticipating, monitoring, responding, and learning into operations) and conducting related training, generic or tailored to the work at hand.

Mentoring, Observation, and Coaching. I work with line managers and supervisors in a facilitative, advisory role to improve their oversight of human performance strategically, operationally, and in the field (observation and coaching).

- One-day classroom training session followed by One-on-One in-field mentoring
- 4-hr. mentoring sessions
- 4-hour segments
- Each session involves an observation and a follow up coaching session.
- Maximum of 2 leaders per day; maximum of 8 per week

- Operator Aid: Provide each leader with a generic set of sentence starters to aid them in debriefing those observed.

Local Rationality Event Analysis. People do things that make sense to them at the time. Otherwise, they would not do them. This is the essence of local rationality, which assumes people want to do a good job, not wanting to fail. The overall analysis approach adopts a non-judgmental, non-accusing approach, unless there is clear evidence of malicious intent to the contrary—accountability is preserved (See Principle No.1). The analyst is trained to explore relevant workplace conditions that contributed to the choices people made and to the failure of defenses to protect assets from harm, as well as identifying the related organizational factors (causes). The local rationality methodology is supported by two other analysis methods to validate what happened: local factor analysis and behavior choice assessment.

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